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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,308	02/20/2002	Michael Richard Betker	8-8-16	9936

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FAIRFIELD, CT 06824

EXAMINER

TANG, KENNETH

ART UNIT	PAPER NUMBER
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2195

MAIL DATE	DELIVERY MODE
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07/23/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/081,308

Applicant(s)

BETKER ET AL.

Examiner

Kenneth Tang

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-10, 12-13, 15-18, and 20 is/are rejected.
- 7) ☒ Claim(s) 5, 11, 14 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the Amendment filed on 5/8/07. Applicant's arguments have been fully considered but were not found to be persuasive. Applicant's amendment to the claims prompted the new grounds of rejections.
2. Claims 1-20 are presented for examination.

Allowable Subject Matter

3. Claims 5, 11, 14, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and that the below 35 USC 101 rejections are overcome.

Claim Objections

4. Claims 1, 7, 13, and 16 are objected to because of the following informalities: a period is missing at the end of each of the claims. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 6-10, 12-13, 15-18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable by Prasanna (US 6,272,599 B1) in view of Prasanna (hereinafter Prasanna 2) (US 6,317,874 B1).

6. As to claim 1, Prasanna teaches a method for establishing a bound on the execution time (worst case execution time, WCET) of an application due to task interference in an instruction cache shared by a plurality of tasks, said method comprising the steps of: determining a number of live frames (live when cache bit is set to 1) of said application that are coexistent during execution of said application; and establishing said bound based on said number of live frames (see Abstract, col. 2, lines 23-58, col. 3, lines 1-30).

7. Prasanna is silent in teaching that the bound (WCET) is suitable for use in allocating processing resources. However, Prasanna2 teaches determining a worst-case-execution-time (WCET) and after its determination, an indication is made to system engineers whether hardware, software or other system changes are needed in order to satisfy system requirements (col. 1, lines 26-30). Prasanna and Prasanna2 are analogous art because they are from the same field of endeavor of a cache-based architecture that analyzes the worst-case-execution-time. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Prasanna's invention of determination of WCET with Prasanna2's invention of making an indication in response to the determination of the WCET. The suggestion/motivation for doing so would have been to have the ability to respond to the WCET information in such a way to ensure satisfaction of system requirements (col. 1, lines 26-30).

8. As to claim 2, Prasanna teaches wherein said number of live frames is a number of cache frames that contain a block that is accessed by said application in the future without an intervening eviction (col. 2, lines 23-38).

9. As to claim 3, Prasanna teaches wherein said number of live frames is determined and monitored during run-time (see above rejection) but is silent in having post-execution analysis of the cache access patterns. However, it would be obvious to one of ordinary skill in the art to modify Prasanna's invention to have post-execution analysis because more time could be given in the analysis since it is not limited to occur during the execution time.

10. As to claim 4, Prasanna teaches wherein said number of live frames is determined by a run-time analysis of cache access patterns of a simulation of said application (col. 3, lines 25-30).

11. As to claim 6, Prasanna teaches wherein said step of establishing said bound further comprises the steps of determining an effect of an interrupt at each possible interrupt point and establishing said bound based on a maximum of said effect of an interrupt at each possible interrupt point (col. 3, lines 1-14). It is inherent that there are interrupts occurring in the processing system and that the interrupt points are evident at the various points where the system is being processed dynamically.

12. As to claim 7, it is rejected for the same reasons as stated in the rejection of claim 1.

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13. As to claims 8-10, they are rejected for the same reasons as stated in the rejections of claims 2-4.

14. As to claims 12-13, they are rejected for the same reasons as stated in the rejection of claims 6-7.

15. As to claim 15, it is rejected for the same reasons as stated in the rejections of claims 6.

16. As to claim 16, it is rejected for the same reasons as stated in the rejection of claim 1.

17. As to claims 17-18, they are rejected for the same reasons as stated in the rejections of claims 3-4.

18. As to claim 20, it is rejected for the same reasons as stated in the rejections of claim 6.

Response to Arguments

19. During patent examination, the pending claims must be “given their broadest reasonable interpretation consistent with the specification.” *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000). Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once

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issued, will be interpreted more broadly than is justified. *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969).

20. *Applicant argues that Prasanna does not address establishing a bound on the execution time of an application.*

In response, Prasanna does address this and teach a worst-case execution time (WCET) performance of an application (see Abstract). The worst-case is a bound. The broadest reasonable interpretation of the claims are satisfied.

21. *Applicant argues that Prasanna does not teach the “effect of task interference on an application”.*

22. In response to applicant's arguments, the recitation “task interference on an application” has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

23. *Applicant argues that Prasanna does not determine a number of live frames and establishing a bound based on the number of live frames.*

In response, Prasanna teaches determining a percentage of cache hits (when cache bit is 1, it is a live frame) so that the WCET (the bound) can be determined (col. 2, lines 23-38). And

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in order to calculate said percentage, the number of live frames (times when cache bit is set to 1) needs to be calculated.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth Tang whose telephone number is (571) 272-3772. The examiner can normally be reached on 8:30AM - 6:00PM, Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kt
7/19/07

M MENG-AL ZAN
SUPERVISORY PATENT EXAMINER
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